State of California

AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1985 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL-ENGINES AND VEHICLES

Adopted:	April 8, 1985
Amended:	July 29, 1986
Amended:	January 19, 1990
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Amended:	October 22, 1993
Amended:	March 24, 1994
Amended:	September 22, 1994
Amended:	June 29, 1995
Amended:	June 4, 1997

NOTE: This document incorporates by reference various sections of the Code of Federal Regulations, some with modifications. California provisions which replace specific federal provisions are denoted by the words "DELETE" for the federal language and "REPLACE WITH" for the new California language. The symbols "*****" and "..." mean that the remainder of the federal text for a specific section, which is not shown in these procedures, has been included by reference, with only the printed text changed. Federal regulations that are not listed are not part of the procedures.

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1985 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL-ENGINES AND VEHICLES

The following provisions of Subparts A, I, and N, Part 86, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency on the date listed, and only to the extent they pertain to the testing and compliance of exhaust emissions from heavy-duty diesel engines and vehicles, are adopted and incorporated herein by this reference as the California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles, except as altered or replaced by the provisions set forth below.

The federal regulations contained in the Subparts identified above which pertain to oxides of nitrogen emission averaging shall not be applicable to these procedures. The federal regulations contained in the Subparts identified above which pertain to particulate emission averaging shall not be applicable to these procedures for 1996 and later model engines and vehicles. The smoke exhaust test procedures shall be applicable to California petroleum-fueled, liquefied-petroleum gas-fueled, and compressed natural gas-fueled heavy-duty diesel engines and vehicles for 1988 and later model years.

Starting with the 1990 model year, these regulations shall be applicable to all heavy-duty diesel natural-gas-fueled and liquefied-petroleum gas-fueled engines (and vehicles) including those engines derived from existing diesel engines. For any engine which is not a distinctly diesel engine nor derived from such, the Executive Officer shall determine whether the engine shall be subject to these regulations or alternatively to the heavy-duty Otto-cycle engine regulations, in consideration of the relative similarity of the engine's torque-speed characteristics and vehicle applications with those of diesel and Otto-cycle engines.

The regulations concerning the certification of methanol-fueled diesel urban bus engines are not applicable in California until 1991 and subsequent model years. The regulations concerning the certification of all other methanol-fueled diesel engines and vehicles are not applicable in California until 1993 and subsequent model years.

Regulations concerning the certification of incomplete medium-duty diesel low-emission vehicles and engines and ultra-low-emission vehicles and engines operating on any fuel are applicable for the 1992 and subsequent model years.

Subpart A - General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, Light-Duty Trucks, and Heavy-Duty Engines, and for 1985 and later Model Year New Gasoline-Fueled and Methanol-Fueled Heavy-Duty Vehicles.

86.085-1 General Applicability. March 15, 1985.

* * * * *

(b) ... may request to certify any pre-1996 model year heavy-duty vehicle 10,000 pounds GVWR or less to the medium-duty vehicle exhaust emission standards. Heavy-duty...

* * * * *

(e) ... projected combined California sales of passenger cars, light-duty trucks, medium-duty vehicles and heavy-duty engines in its product line are fewer than 3,000 units for the model...

86.090-1 General Applicability. April 11, 1989.

(a) ... heavy-duty engines. Starting with the 1990 model year, the provisions of this subpart are also applicable to all dedicated gaseous-fuel, dual-fuel and multi-fuel diesel engines (or vehicles) including those engines derived from existing diesel engines. Any reference to diesel engines and vehicles shall also apply to gaseous-fuel engines and vehicles, except where specifically noted. Starting with the 1992 model year, the provisions of this subpart are also applicable to incomplete medium-duty diesel low-emission vehicles and engines and ultra-low-emission vehicles and engines operating on any fuel.

(b) ... Gross Vehicle Weight Rating or less to the medium-duty vehicle exhaust emission standards. Heavy-duty...

* * * * *

(e) ... projected combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty engines in its product line are fewer than 3,000 units for the model...

86.085-2 Definitions. November 16, 1983.

* * * * *

"Administrator" DELETE
REPLACE WITH:
"Administrator" means the Executive Officer of the Air Resources Board.

* * * * *

"Certificate of Conformity" DELETE
REPLACE WITH:
"Certificate of Conformity" means "Executive Order" certifying vehicles for sale in California.

"Certification" DELETE
REPLACE WITH:
"Certification" means certification as defined in Section 39018 of the Health and Safety Code.

* * * * *

"Heavy-Duty Engine" DELETE
REPLACE WITH:
"Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.

"Heavy-Duty Vehicle" DELETE
REPLACE WITH:
"Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6,000 pounds, except passenger cars.

* * * * *

"Medium-duty vehicle" means any pre-1995 model-year heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8,500 pounds or less, any 1992 and subsequent model-year heavy-duty low-emission vehicle or ultra-low-emission vehicle having a manufacturer's gross vehicle weight rating of 14,000 pounds or less, or any 1995 or subsequent model year heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 14,000 pounds or less.

* * * * *

"Useful life" means:

* * * * *

(f) DELETE
REPLACE WITH:
(f) The useful-life period for purposes of the emissions defect warranty shall be a period of 5 years/100,000 miles, whichever first occurs, for all heavy-duty diesel engines. However, in no case may this period be less than the manufacturer's basic mechanical warranty period for the engine family.

* * * * *

86.088-2 Definitions. March 15, 1985.
86.090-2 Definitions. April 11, 1989.
86.091-2 Definitions. March 15, 1985.

* * * * *

"Gaseous Fuel" means compressed natural gas or liquefied petroleum gas fuel for use in motor vehicles and engines.

"Dedicated Gaseous-Fuel Engine" means any gaseous-fuel engine that is engineered and designed to be operated solely on a gaseous fuel.

"Dual-Fuel Engine" means any gaseous-fuel engine that is engineered and designed to be operated on either a gaseous fuel or a petroleum fuel.

"Multi-Fuel Engine" means any gaseous-fuel engine that is engineered and designed to be operated with a gaseous fuel simultaneously with a petroleum fuel.

86.093-2 Definitions. March 24, 1993.

The definitions of 86.092-2 remain effective. The definitions listed in this section apply beginning with the 1993 model year.

* * * * *

Urban bus means a passenger-carrying vehicle powered by a heavy heavy-duty diesel engine, or of a type normally powered by a heavy heavy-duty diesel engine, with a load capacity of fifteen or more passengers and intended primarily for intra-city operation, i.e., within the confines of a city or greater metropolitan area. Urban bus operation is characterized by short rides and frequent stops. To facilitate this type of operation, more than one set of quick-operating entrance and exit doors would normally be installed. Since fares are usually paid in cash or tokens, rather than purchased in advance in the form of tickets, urban buses would normally have equipment installed for collection of fares. Urban buses are also typically

characterized by the absence of equipment and facilities for long distance travel, e.g., rest rooms, large luggage compartments, and facilities for stowing carry-on luggage. The useful life for urban buses is the same as the useful life for other heavy heavy-duty diesel engines.

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86.094-2 Definitions. March 24, 1993.

* * * * *

Useful life means:

* * * * *

(d) For a diesel heavy-duty engine family:

(1) For light heavy-duty diesel engines, a period of use of 8 years or 110,000 miles, whichever first occurs.

(2) For medium heavy-duty diesel engines, a period of use of 8 years or 185,000 miles, whichever first occurs.

(3) For heavy heavy-duty diesel engines, a period of use of 8 years or 290,000 miles, whichever first occurs, except as provided in paragraph (4).

(4) For heavy heavy-duty diesel engines used in urban buses, for the particulate standard, a period of use of 10 years or 290,000 miles, whichever first occurs.

* * * * *

86.098-2 Definitions. April 6, 1994.

The definitions of §86.096-2 continue to apply to 1996 and later model year vehicles. DELETE. The definitions listed in this section apply beginning with the 1998 model year.

"Dispensed fuel temperature" DELETE

"Evaporative/refueling emission control system" DELETE

"Evaporative/refueling emission family" DELETE

"Integrated refueling emission control system" DELETE

"Non-integrated refueling emission control system" DELETE

"Refueling emissions" DELETE

"Refueling emission canister(s)" DELETE

"Resting losses" DELETE

Useful life means:

(1) DELETE
(2) DELETE
(3) DELETE
(4) For a diesel heavy-duty engine family:
(i) DELETE
(ii) For light heavy-duty diesel engines, for the oxides of nitrogen standard, a period of use of 10 years or 110,000 miles, whichever first occurs.
(iii) DELETE
(iv) For medium heavy-duty diesel engines, for the oxides of nitrogen standard, a period of use of 10 years or 185,000 miles, whichever first occurs.
(v) DELETE
(vi) For heavy heavy-duty diesel engines, for the oxides of nitrogen standard, a period of use of 10 years or 290,000 miles, whichever first occurs.
(vii) DELETE

86.078-3 Abbreviations. January 21, 1980.
86.090-3 Abbreviations. April 11, 1989.
86.084-4 Section numbering; construction. September 25, 1980.
86.084-5 General standards; increase in emissions; unsafe conditions. November 2, 1982.
86.090-5 General standards; increase in emissions; unsafe conditions. April 11, 1989.
86.078-7 Maintenance of records; submittal of information; right of entry. November 2, 1982.
86.085-11 Emission standards for 1985 and later model year diesel heavy-duty engines. November 16, 1983.

* * * * *

(a)(1)(iii) Oxides of Nitrogen. 5.1 grams per ...

* * * * *

(b) DELETE
REPLACE WITH:

(b) At the option of the manufacturer, the standards set forth in Section 86.088-11, paragraph (a)(1) can replace the standards set forth in paragraph (a)(1), applicable to new 1987 model year diesel heavy-duty engines only.

* * * * *

(d)...in Subpart N of this part to ascertain...

* * * * *

86.088-11 Emission standards for 1988 and later model year diesel heavy-duty engines. March 15, 1985.
86.090-11 Emission standards for 1990 and later model year diesel heavy-duty engines and vehicles. April 11, 1989.

* * * * *

(b)(1) The opacity of smoke emission from new 1990 and later model year petroleum-fueled diesel heavy-duty engines shall not exceed:

* * * * *

86.091-11 Emission standards for 1991 and later model year diesel heavy-duty engines and vehicles. April 11, 1989.

* * * * *

(a)(1)(iv)(C) A manufacturer may elect to include all or some of its diesel heavy-duty engine families in the appropriate heavy-duty particulate averaging program (petroleum or methanol or gaseous fuel), provided that engines produced for sale in California or in 49-state areas may be averaged only within each of those areas. Dual-fuel and multi-fuel engines may not be included in the diesel particulate averaging program. With the exceptions regarding methanol-fueled or gaseous-fuel diesel urban bus engines as noted below, averaging is not permitted between fuel types. Non-methanol-fueled and non-gaseous-fuel engines for use in urban buses may not be included in either heavy-duty particulate averaging program. Emissions from methanol-fueled and dedicated gaseous-fuel urban bus engines certified to 0.10 grams per brake horsepower-hour particulates may be included in the averaging program for petroleum fueled engines other than urban bus engines. Averaging is limited to engines within a given primary service class as defined in 86.085-2. Averaging across primary service classes is not permitted. If the manufacturer elects to participate in either averaging program, individual family particulate limits may not exceed 0.60 gram per brake horsepower-hour (0.22 grams per megajoule). Heavy-duty diesel engines converted to methanol fuel or gaseous fuel may be used to comply with the

urban bus particulate standard and may be used in the diesel particulate averaging program. Such engines must comply with all applicable heavy-duty diesel engine emission standards and test procedures in this Part.

* * * * *

(a)(2) Manufacturers may choose to certify diesel and incomplete medium-duty vehicles from 8501-14,000 pounds, gross vehicle weight to the emission standards and test procedures specified below as an alternative to the primary standards and test procedures specified in Section 1960.1, Title 13, California Code of Regulations. Manufacturers certifying medium-duty vehicles to these optional heavy-duty standards and test procedures shall reimburse the cost of in-use procurement and compliance testing as specified in Sections 2136 through 2140, Title 13, California Code of Regulations. Exhaust emissions from new 1995 and later model year medium-duty vehicles certifying to the optional heavy-duty engine test procedures shall not exceed the following:

(i) Carbon Monoxide. 14.4 grams per brake horsepower-hour, as measured under transient operating conditions.
(ii) Non-Methane Hydrocarbons and Oxides of Nitrogen. 3.9 grams per brake horsepower-hour total, as measured under transient operating conditions.
(iii) Particulate Emissions. 0.10 grams per brake horsepower-hour, as measured under transient operating conditions.

(a)(3) Manufacturers may choose to certify incomplete medium-duty low-emission and ultra-low-emission vehicles from 8501-14,000 pounds, gross vehicle weight to the emission standards and test procedures specified below as an alternative to the primary standards and test procedures specified in Section 1960.1, Title 13, California Code of Regulations. Manufacturers certifying medium-duty low-emission and ultra-low-emission vehicles to these optional heavy-duty standards and test procedures shall specify, in the application for certification, an in-use compliance test procedure, as provided in Section 2139(c), Title 13, California Code of Regulations. Exhaust emissions from new 1992 and later model year medium-duty low-emission (LEV) and ultra-low-emission (ULEV) vehicles certifying to the optional heavy-duty engine test procedures shall not exceed the following:

(i) Carbon Monoxide. 14.4 grams per brake horsepower-hour for LEVs and 7.2 grams per brake horsepower-hour for ULEVs, as measured under transient operating conditions.
(ii) Non-Methane Hydrocarbons and Oxides of Nitrogen. 3.5 grams per brake horsepower-hour total for LEVs and 2.5 grams per brake horsepower-hour total for ULEVs, as measured under transient operating conditions.

(iii) Particulate Emissions. 0.10 grams per brake horsepower-hour for LEVs and 0.05 grams per brake horsepower-hour for ULEVs, as measured under transient operating conditions.
(iv) Formaldehyde Emissions. 0.050 grams per brake horsepower-hour for LEVs and 0.025 grams per brake horsepower-hour for ULEVs, as measured under transient operating conditions.

(4) The standards set forth in paragraphs (a)(1), (a)(2), and (a)(3) ....

* * * * *

(b)(1) The opacity of smoke emission from new 1991 and later model year petroleum-fueled diesel heavy-duty engines shall not exceed:

* * * * *

86.094-11 Emission standards for 1994 and later model year diesel heavy-duty engines and vehicles. March 24, 1993.

* * * * *

(a)(1)(iv) Particulate. (A) For diesel engines to be used in urban buses, 0.07 gram per brake horsepower-hour (0.026 gram per megajoule), as measured under transient operating conditions.
(B) For all other diesel engines only, 0.10 gram per brake horsepower-hour (0.037 gram per megajoule), as measured under transient operating conditions.
(C) A manufacturer may elect to include all or some of its diesel heavy-duty engine families in the appropriate heavy-duty particulate averaging program (petroleum or methanol or gaseous fuel), provided that engines produced for sale in California or in 49-state areas may be averaged only within each of those areas. Dual-fuel and multi-fuel engines may not be included in the diesel particulate averaging program. With the exceptions regarding methanol-fueled or gaseous-fuel diesel urban bus engines as noted below, averaging is not permitted between fuel types. Non-methanol-fueled and non-gaseous-fuel engines for use in urban buses may not be included in either heavy-duty particulate averaging program. Emissions from methanol-fueled and dedicated gaseous-fuel urban bus engines certified to 0.10 grams per brake horsepower-hour particulates for 1991-1993 model years, and certified to 0.07 grams per brake horsepower-hour particulates for 1994-1995 model years, may be included in the averaging program for petroleum fueled engines other than urban bus engines. Averaging is limited to engines within a given primary service class as defined in 86.085-2. Averaging across primary service classes is not permitted. If the manufacturer elects to participate in either averaging program, individual family particulate limits may not exceed 0.60 gram per brake horsepower-hour (0.22 grams

per megajoule). Heavy-duty diesel engines converted to methanol fuel or gaseous fuel may be used to comply with the urban bus particulate standard and may be used in the diesel particulate averaging program. Such engines must comply with all applicable heavy-duty diesel engine emission standards and test procedures in this Part.

* * * * *

(a)(2) A manufacturer may elect to certify 1994 and 1995 model year heavy heavy-duty diesel engines to be used in urban buses to an optional oxides of nitrogen emission standard between 0.5 grams per brake horsepower-hour and 3.5 grams per brake horsepower-hour at 0.5 grams per brake horsepower-hour increments, as measured under transient operating conditions.

(b)(1) The opacity of smoke emission from new 1994 and later model year petroleum-fueled diesel heavy-duty engines shall not exceed:

* * * * *

86.096-11 Emission standards for 1996 and later model year diesel heavy-duty engines and vehicles. March 24, 1993.

(a) Exhaust emissions from new 1996 and later model year diesel heavy-duty engines shall not exceed the following:

(1)(i) Hydrocarbons (for petroleum-fueled diesel engines). 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(ii) Organic Material Hydrocarbon Equivalent (for methanol-fueled diesel engines). 1.3 grams per brake horsepower-hour (0.48 gram per megajoule), as measured under transient operating conditions.

(iii) Non-Methane Hydrocarbons (an option for diesel, natural gas, or liquefied petroleum gas engines). 1.2 grams per brake horsepower-hour, as measured under transient operating conditions.

(2) Carbon Monoxide. (i) 15.5 grams per brake horsepower-hour (5.77 grams per megajoule), as measured under transient operating conditions.

(ii) 0.50 percent of exhaust gas flow at curb idle (methanol-fueled diesel only).

(3) Oxides of Nitrogen. (i) For diesel engines to be used in urban buses, 4.0 grams per brake horsepower-hour, as measured under transient operating conditions.

(ii) For all other diesel engines only, 5.0 grams per brake horsepower-hour (1.9 grams per megajoule), as measured under transient operating conditions.

(iii) DELETE

(iv) A manufacturer may apply to the Executive Officer for an exemption from the 4.0 gram per brake horsepower-hour standard for oxides of nitrogen for 1996 and 1997 model year urban bus engines for which the manufacturer can demonstrate a technological need for the exemption. The exemption or exemptions shall not exceed

10 percent of the average of the manufacturer's total urban bus engine sales in California for the three model years prior to the model year for which an exemption is requested. The manufacturer shall submit technical justification for each engine model and shall provide the number of urban bus engine sales in California for the engine model for which the exemption is requested (if any) and for all urban bus engine models for the three preceding model years, to the Executive Officer when the manufacturer applies for the exemption.

(4) Particulate. (i) For diesel engines to be used in urban buses, 0.05 gram per brake horsepower-hour (0.019 gram per megajoule) for certification testing and 0.07 gram per brake horsepower-hour (0.026 gram per megajoule) for in-use testing, as measured under transient operating conditions.

(ii) For all other diesel engines only, 0.10 gram per brake horsepower-hour (0.037 gram per megajoule), as measured under transient operating conditions.

(iii) DELETE

(5) A manufacturer may elect to certify 1996 and later model year heavy heavy-duty diesel engines to be used in urban buses to an optional oxides of nitrogen emission standard between 0.5 grams per brake horsepower-hour and 2.5 grams per brake horsepower-hour at 0.5 grams per brake horsepower-hour increments, as measured under transient operating conditions.

(b)(1) The opacity of smoke emission from new 1996 and later model year petroleum-fueled diesel heavy-duty engines shall not exceed:

* * * * *

86.098-11 Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles and optional standards for 1995 through 1997 model year diesel heavy-duty engines. March 24, 1993.

(a) Exhaust emissions from new 1998 and later model year diesel heavy-duty engines shall not exceed the following:

(1) DELETE

(2) DELETE

(3) Oxides of Nitrogen. (i) 4.0 grams per brake horsepower-hour (1.49 grams per megajoule), as measured under transient operating conditions.

(ii) A manufacturer may elect to certify 1998 and later model year diesel engines, for use in vehicles with a Gross Vehicle Weight Rating of greater than 14,000 pounds, other than urban transit buses, to an optional oxides of nitrogen standard between 0.5 grams per brake horsepower-hour and 2.5 grams per brake horsepower-hour, inclusive, at 0.5 grams per brake horsepower-hour increments, as measured under transient operating conditions.

(4) DELETE

(b) DELETE
(c) DELETE
(d) DELETE
(e)(1) Exhaust emission standards for certain 1995 and later model year heavy-duty diesel engines may be optionally selected as follows:
(i) A manufacturer may elect to certify 1996 and later model year diesel engines for use in urban buses, to an optional oxides of nitrogen standard between 0.5 grams per brake horsepower-hour and 2.5 grams per brake horsepower-hour, inclusive, at 0.5 grams per brake horsepower-hour increments, as measured under transient operating conditions.
(ii) A manufacturer may elect to certify 1995 through 1997 model year diesel engines for use in vehicles with a Gross Vehicle Weight Rating of greater than 14,000 pounds except urban bus engines, and 1994 through 1995 model year urban bus engines, to an optional oxides of nitrogen standard between 0.5 grams per brake horsepower-hour and 3.5 grams per brake horsepower-hour, inclusive, at 0.5 grams per brake horsepower-hour increments, as measured under transient operating conditions.

86.080-12 Alternative certification procedures. April 17, 1980.
86.084-14 Small-volume manufacturers certification procedures. January 31, 1985.

* * * * *

(b)(1) ...produced by manufacturers with California sales (for the model year in which certification is sought) of fewer than 3,000 units (PC, LDT, MDV, and HDE combined).

* * * * *

(c)(4) DELETE
REPLACE WITH:
(c)(4) Small volume manufacturers shall include in their records all of the information that EPA requires in 86.084-21. This information will be considered part of the manufacturer's application for certification.

* * * * *

(c)(7)(i)(C) ...determines and prescribes based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience. However, ...

* * * * *

(c)(11)(ii)(D)(1) ...We project the total California sales of vehicles (engines) subject to this subpart to be fewer than 3,000 units.

* * * * *

(c)(13)(ii) ...affect vehicle emissions. All running changes which do not adversely affect emissions or the emissions control system durability are deemed approved unless disapproved by the Executive Officer within 30 days of the implementation of the running change. This...

* * * * *

86.090-14 Small-volume manufacturers certification procedures. April 11, 1989.

* * * * *

(b)(1) ...produced by manufacturers with California sales (for the model year in which certification is sought) of fewer than 3,000 units (PC, LDT, MDV, and HDE combined).

* * * * *

(c)(4) DELETE
REPLACE WITH:
(c)(4) The manufacturer shall include in its records all of the information that EPA requires in 86.088-21 of this subpart. This information will be considered part of the manufacturer's application for certification.

* * * * *

(c)(7)(i)(C) ...determines and prescribes based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience. However ...

* * * * *

(c)(11)(ii)(D)(1) ... We project the total California sales of vehicles (engines) subject to this subpart to be fewer than 3,000 units.

* * * * *

(c)(13)(ii) ...affect vehicle emissions. All running changes which do not adversely affect emissions or the emissions control system durability are deemed approved

unless disapproved by the Executive Officer within 30 days of the implementation of the running change. This ...

86.085-20 Incomplete vehicles, classification. January 12, 1983.
86.085-21 Application for certification. December 10, 1984.
86.087-21 Application for certification. November 16, 1983.
86.088-21 Application for certification. March 15, 1985.
86.090-21 Application for certification. April 11, 1989.
86.091-21 Application for certification. April 11, 1989.

* * * * *

(b)(2) For 1992 and subsequent model-year low-emission and ultra-low-emission vehicles and engines not powered exclusively by diesel, projected California sales data and fuel economy estimates two years prior to certification, and projected California sales data for all vehicles and engines, regardless of operating fuel or vehicle emission category, sufficient to enable the Executive Officer to select a test fleet representative of the vehicles (or engines) for which certification is requested at the time of certification.

* * * * *

86.085-22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and selective enforcement audit, adequacy of limits, and physically adjustable ranges. August 30, 1985.

DELETE any reference to Selective Enforcement Audit.

86.090-22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and selective enforcement audit, adequacy of limits, and physically adjustable ranges. April 11, 1989.

DELETE any reference to Selective Enforcement Audit.

86.085-23 Required data. March 15, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering

practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.

* * * * *

86.087-23 Required data. March 15, 1985.

* * * * *

(b)(1)(ii)...useful life of the engine. Such data shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.

* * * * *

86.088-23 Required data. July 19, 1985.

* * * * *

(b)(1)(ii)...useful life of the engine. Such data shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.

* * * * *

(f) DELETE

* * * * *

86.090-23 Required data. April 11, 1989

* * * * *

(b)(1)(ii)...useful life of the engine. Such data shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.

* * * * *

(c) ...as required under 86.090-26(a)(3)(i) or 86.090-26(a)(3)(ii). In lieu of providing emission data on idle CO emissions or particulate emissions from methanol-fueled diesel certification vehicles...

* * * * *

(f) DELETE

* * * * *

86.091-23 Required data. April 11, 1989.

* * * * *

(b)(1)(ii)...useful life of the engine. Such data shall be submitted to the Executive Officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the Executive Officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the Executive Officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the Executive Officer for review and approval.

* * * * *

(c) ...as required under 86.090-26(a)(3)(i) or 86.090-26(a)(3)(ii). In lieu of providing emission data on idle CO emissions or particulate emissions from methanol-fueled diesel certification vehicles...

* * * * *

86.085-24 Test vehicles and engines. December 10, 1984.

* * * * *

(e)(1)(i) DELETE
REPLACE WITH:
(e)(1)(i) a combined total of 3,000 California passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty engines,
(e)(1)(ii) DELETE
(e)(1)(iii) DELETE
(e)(1)(iv) DELETE
(e)(1)(v) DELETE
(e)(1)(vi) may request a reduction in the number of test vehicles (or engines)...
(e)(2)...total sales of fewer than 3,000...

* * * * *

(f) ...submitted. Durability data submitted may be from engines previously certified by the EPA or the Air Resources Board.

* * * * *

86.090-24 Test vehicles and engines. April 11, 1989.

* * * * *

(e)(1)(i) DELETE
REPLACE WITH:
(e)(1)(i) A combined total of 3,000 California passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty engines,
(e)(1)(ii) DELETE
(e)(1)(iii) DELETE
(e)(1)(iv) DELETE
(e)(1)(v) DELETE
(e)(1)(vi) may request a reduction in the number of test vehicles (or engines)...
(e)(2) ... total sales of fewer than 3,000...

* * * * *

(f) ...submitted. Durability data submitted may be from engines previously certified by the EPA or the Air Resources Board.

* * * * *

86.085-25 Maintenance. November 16, 1983.

86.087-25 Maintenance. March 15, 1985.
86.088-25 Maintenance. March 15, 1985.
86.090-25 Maintenance. April 11, 1989.
86.084-26 Mileage and service accumulation; emission measurements. October 19, 1983.
86.090-26 Mileage and service accumulation; emission measurements. April 11, 1989.
86.085-27 Special test procedures. January 12, 1983.
86.090-27 Special test procedures. April 11, 1989.
86.085-28 Compliance with emission standards. January 24, 1985.
86.087-28 Compliance with emission standards. March 15, 1985.
86.088-28 Compliance with emission standards. March 15, 1985.
86.090-28 Compliance with emission standards. April 11, 1989.

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(c)(4)(ii) ...and exhaust particulate. For petroleum-fueled diesel smoke testing...

(c)(4)(iii)(B)(1)...For transient HC (OMHCE), formaldehyde (methanol-fueled engines and vehicles, low-emission vehicles and engines, and ultra-low-emission vehicles and engines), CO, and NOx, the official exhaust emission...

(c)(4)(iii)(B)(2)...For transient HC (OMHCE), formaldehyde (methanol-fueled engines and vehicles, low-emission vehicles and engines, and ultra-low-emission vehicles and engines), CO, and NOx, the official exhaust emission...

(c)(4)(iii)(B)(3) Petroleum-fueled diesel heavy-duty engines only.

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86.091-28 Compliance with emission standards. April 11, 1989.

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(c)(4)(ii)...and exhaust particulate. For petroleum-fueled diesel smoke testing...

(c)(4)(iii)(B)(1)...For transient HC (OMHCE), formaldehyde (methanol-fueled engines and vehicles, low-emission vehicles and engines, and ultra-low-emission vehicles and engines), CO, and NOx, the official exhaust emission...

(c)(4)(iii)(B)(2)...For transient HC (OMHCE), formaldehyde (methanol-fueled engines and vehicles, low-emission vehicles and engines, and ultra-low-emission vehicles and engines), CO, and NOx, the official exhaust emission...

(c)(4)(iii)(B)(3) Petroleum-fueled diesel heavy-duty engines only.

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86.085-29 Testing by the Administrator. January 24, 1984.
86.087-29 Testing by the Administrator. January 24, 1984.
86.088-29 Testing by the Administrator. March 15, 1985.
86.090-29 Testing by the Administrator. April 11, 1989.
86.091-29 Testing by the Administrator. April 11, 1989.
86.085-30 Certification. January 24, 1984.
86.087-30 Certification. August 30, 1985.
86.088-30 Certification. March 15, 1985.
86.090-30 Certification. April 11, 1989.
86.091-30 Certification. April 11, 1989.
86.079-31 Separate certification. September 8, 1977.
86.079-32 Addition of a vehicle or engine after certification. September 8, 1977.
86.079-33 Changes to a vehicle or engine covered by certification. September 8, 1977.
86.082-34 Alternative procedure for notification of additions and changes. November 2, 1982.
86.085-35 Labeling. Labels shall comply with the requirements set forth in the "California Motor Vehicle Emission Control Label Specifications," as last amended June 29, 1995.
86.085-37 Production vehicles and engines. January 12, 1983.
86.085-38 Maintenance instructions. November 16, 1983.
86.087-38 Maintenance instructions. March 15, 1985.
86.084-40 Automatic expiration of reporting and recordkeeping requirements. September 25, 1980.

Subpart I - Emission Regulations for New Diesel-Fueled Heavy-Duty Engines; Smoke Exhaust Test Procedure

86.884-1 General Applicability. April 11, 1989.

The provisions of this subpart are applicable to new petroleum-fueled diesel heavy-duty engines beginning with the 1984 model year.

The provisions of this subpart are not applicable to new heavy-duty diesel gaseous-fuel engines and those gaseous-fuel engines derived from diesel engines, except dual-fuel and multi-fuel engines which use petroleum fuel.

86.884-2 Definitions. November 16, 1983.
86.884-3 Abbreviations. November 16, 1983.
86.884-4 Section numbering. November 16, 1983.
86.884-5 Test Procedures. April 11, 1989.
86.884-6 Fuel specifications. April 11, 1989.
86.884-7 Dynamometer operation cycle for smoke emission tests. November 16, 1983.

86.884-8 Dynamometer and engine equipment. November 16, 1983.
86.884-9 Smoke measurement system. November 16, 1983.
86.884-10 Information. November 16, 1983.
86.884-11 Instrument checks. November 16, 1983.
86.884-12 Test run. November 16, 1983.
86.884-13 Data analysis. November 16, 1983.
86.884-14 Calculations. November 16, 1983.

Subpart N - Emission Regulations for New Otto-Cycle and Diesel Heavy-Duty Engines; Gaseous and Particulate Exhaust Test Procedures

86.1301-84 Scope; applicability. November 16, 1983.
86.1301-88 Scope; applicability. March 15, 1985.
86.1301-90 Scope; applicability. April 11, 1989.
86.1302-84 Definitions. November 16, 1983.
86.1303-84 Abbreviations. November 16, 1983.
86.1304-84 Section numbering; construction. November 16, 1983.
86.1304-90 Section numbering; construction. April 11, 1989.
86.1305-84 Introduction; structure of subpart. November 16, 1983.
86.1305-90 Introduction; structure of subpart. April 11, 1989.
86.1306-84 Equipment required and specifications; overview. November 16, 1983.
86.1306-88 Equipment required and specifications; overview. March 15, 1985.
86.1306-90 Equipment required and specifications; overview. April 11, 1989.
86.1308-84 Dynamometer and engine equipment specifications. December 10, 1984.
86.1309-84 Exhaust gas sampling system; gasoline-fueled engines. November 16, 1983.
86.1309-90 Exhaust gas sampling system; gasoline-fueled and throttled methanol-fueled engines. April 11, 1989.
86.1309-90 Exhaust gas sampling system; gasoline-fueled and methanol-fueled Otto-cycle engines. April 11, 1989.

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(a)(3)...For methanol-fueled engines, the sample lines for the methanol and formaldehyde samples are heated to 235 ^{o} ± 15^{o}F (113^{o} ± 8^{o}C).

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86.1310-84 Exhaust gas sampling and analytical system; diesel-fueled engines. December 10, 1984.
86.1310-88 Exhaust gas sampling and analytical system; diesel engines. March 15, 1985.
86.1310-90 Exhaust gas sampling and analytical system; petroleum-fueled and methanol-fueled diesel engines. April 11, 1989.

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(a)(3)...samples collected for these purposes (Figure N90-2 and N90-3).

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86.1311-84 Exhaust gas analytical system, CVS bag sample. November 16, 1983.
86.1311-90 Exhaust gas analytical system, CVS bag sample. April 11, 1989.
86.1312-88 Weighing chamber and microgram balance specifications. March 15, 1985.
86.1313-84 Fuel specifications. December 10, 1984.
86.1313-90 Fuel specifications. April 11, 1989.

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(b)(2) Except as noted below, petroleum fuel for diesel engines ... shall be used. For 1993 and subsequent model-year diesel-fueled engines, the petroleum fuel used in exhaust emissions testing may meet the specifications in Table N94-2 of 40 Code of Federal Regulations section 86.1313-94(b)(2), as adopted August 21, 1990, or substantially equivalent specifications approved by the Executive Officer as an option to the specifications in Table N90-2. For 1995 and subsequent model-year medium-duty diesel-fueled engines, and for 1996 and 1997 model-year urban bus engines only, the petroleum fuel used in exhaust emissions testing may meet the specifications listed below, or substantially equivalent specifications approved by the Executive Officer, as an option to the specifications in Table N90-2. Where a manufacturer elects pursuant to this subparagraph to conduct exhaust emission testing using the specifications in Table N94-2, or the specifications listed below, the Executive Officer shall conduct exhaust emission testing with the diesel fuel meeting the specifications elected by the manufacturer.

Fuel Property	Limit	Test Method [a]
Natural Cetane Number	47-55	D613-86
Distillation Range, °F		Title 13 CCR, §2282(g)(3)
IBP	340-420	
10% point	400-490	
50% point	470-560	
90% point	550-610	
EP	580-660	
API Gravity, degrees	33-39	D287-82
Total Sulfur, wt. %	0.01-0.05	Title 13 CCR, §2282(g)(3)
Nitrogen Content, ppmw	100-500	Title 13 CCR, §2282(g)(3)
Total Aromatic Hydrocarbons, vol.%	8-12	Title 13 CCR, §2282(g)(3)

Polycyclic Aromatic Hydrocarbons, wt. % (max.)	1.4	Title 13 CCR, §2282(g)(3)
Flashpoint, °F (max)	130	D 93-80
Viscosity @ 40°F, centistokes	2.0-4.1	D 445-83

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[a] ASTM specifications unless otherwise noted. A reference to a subsection of Title 13, CCR, §2282 means the test method identified in that subsection for the particular property. A test method other than that specified may be used following a determination by the Executive Officer that the other method produces results equivalent to the results of the specified method.

(b)(3) Except as noted below, petroleum fuel for diesel engines ... shall be used. For 1993 and subsequent model-year diesel-fueled engines, excluding the 1995 and subsequent model-year medium-duty diesel-fueled engines referenced below, the petroleum fuel used in service accumulation may meet the specifications in Table N94-3 of 40 Code of Federal Regulations section 86.1313-94(b)(3), as adopted August 21, 1990, or substantially equivalent specifications approved by the Executive Officer as an option to the specifications in Table N90-3. For 1995 and subsequent model-year medium-duty diesel-fueled engines, and for 1996 and 1997 model-year urban bus engines only, diesel fuel representative of commercial diesel fuel which will be generally available through retail outlets shall be used in service accumulation.

(b)(4)(i) Methanol fuel used in service accumulation of 1991 through 1993 model-year methanol-fueled diesel engines shall be representative of commercially available methanol fuel. Methanol used in fuel for exhaust emission testing of 1991 through 1993 model-year methanol-fueled diesel engines shall be chemical grade methanol. The specifications set forth in subparagraph (b)(4)(ii) may be used as an option for 1993 model-year engines.

(b)(4)(ii) Methanol fuel specifications for 1994 and subsequent model-year methanol-fueled diesel engines.

Mileage-accumulation fuel: For methanol-fueled diesel-cycle methanol engines, fuel which meets the specifications listed in Title 13, CCR, Section 2292.1 or 2292.2, as applicable.

Emission-testing fuel: For methanol-fueled diesel-cycle methanol engines, fuel which meets the specifications listed in Title 13, CCR, Section 2292.1 or 2292.2, as modified by the following:

The fuel specification for 2292.1 shall be modified to: a) require methanol content at 98.0 ± 0.5 volume percent; b) require ethanol content at 1.0 ± 0.1 volume percent; c) require certification gasoline as noted in paragraph 9(a) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles at 1.0 ± 1.0 volume percent.

The specification for 2292.2 shall be modified to require certification gasoline as noted in paragraph 9(a) of the California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles, as the hydrocarbon fraction. The vapor pressure specification for the emission-testing fuel shall be adjusted to 8.0-8.5 psi, using common blending components from the gasoline stream.

(b)(4)(iii) Fuel additives and ignition improvers intended for use in methanol test fuels shall be subject to the approval of the Executive Officer. In order for such approval to be granted, a manufacturer must demonstrate that emissions will not be adversely affected by the use of the fuel additive or ignition improver.

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ADD SUBPARAGRAPH (e) TO READ:

(e) Natural Gas and Liquefied Petroleum Gas Test Fuel.
(e)(1) Natural Gas Test Fuel.
(e)(1)(i) Natural gas used in service accumulation for 1990 through 1993 model-year diesel engines shall be representative of commercial natural gas which is generally available. Natural gas meeting the specifications below, or substantially equivalent specifications approved by the Executive Officer, shall be used in exhaust emission testing for 1990 through 1993 model-year diesel engines. The specifications set forth in subparagraph (e)(1)(ii) may be used as an option for 1993 model-year engines.

Natural Gas Emission Test Fuel Specification

Specification	Value	Tolerance	Calculation Method
Wobbe Number	1350	± 0.5%	ASTM D 1945 Using AGA Bulletin No. 36
Hydrocarbons (expressed as percent of total organic carbon present)			
Methane	88%	± 0.5%	ASTM D 1945

Ethane	8%	± 0.3%	ASTM D 1945
C_3 and higher HC	4%	± 0.2%	ASTM D 1945
C_6 and higher HC	0.5%	maximum	ASTM D 1945
Total unsaturated HC		0.5% maximum	ASTM D 2650

Other Species (expressed as mole percent)

Hydrogen	0.1%	maximum	ASTM D 2650
Carbon Monoxide	0.1%	maximum	ASTM D 2650

Other Requirements

1. Free from liquids over the entire range of temperatures and pressures encountered in the engine and fuel system.
2. Free from solid particulate matter.

(e)(1)(ii) Natural gas used in service accumulation and in exhaust emission testing for 1994 and subsequent model-year engines shall meet the specifications as follows:

Mileage accumulation fuel: Natural gas meeting the specification listed in Title 13, CCR, Section 2292.5 shall be used in service accumulation.

Emission-test fuel: Natural gas meeting specifications listed in Title 13, CCR, Section 2292.5 as modified by the following: a) methane content at 90.0 ± 1.0 mole percent; b) ethane content at 4.0 ± 0.5 mole percent; c) C_3 and higher hydrocarbon content at 2.0 ± 0.3 mole percent; d) oxygen content at 0.5 mole percent maximum; e) inert gas (sum of CO_2 and N_2) content at 3.5 ± 0.5 mole percent.

(e)(2)(i) Liquefied Petroleum Gas Test Fuel. Liquefied petroleum gas used in service accumulation for 1990 through 1993 model-year diesel engines shall be representative of commercial liquefied petroleum gas which is generally available through retail outlets. Liquefied petroleum gas used in exhaust and evaporative emission testing for 1990 through 1993 model-year diesel engines shall conform to NGPA HD-5 specification. The specifications set forth in subparagraph (e)(1)(ii) may be used as an option for 1993 model-year engines.

(e)(2)(ii) Liquefied petroleum gas used in service accumulation and in exhaust and evaporative emission testing for 1994 and subsequent model-year diesel engines shall meet the specifications as follows:

Mileage accumulation fuel: Liquefied petroleum gas meeting the specifications listed in Title 13, CCR, Section 2292.6 shall be used in service accumulation.

Emission-test fuel: Liquefied petroleum gas meeting the specifications listed in Title 13, CCR, Section 2292.6 shall be used for exhaust and evaporative emission testing with the following exceptions: a) propane content limited to 93.5 ± 1.0 volume percent; b) propene content limited to 3.8 ± 0.5 volume percent; and c) butane and heavier components limited to 1.9 ± 0.3 volume percent.

(e)(3) The specification range of the fuels to be used under paragraphs (e)(1) and (e)(2) of this section shall be reported in accordance with 86.090-21(b)(3).

86.1314-84 Analytical gases. December 10, 1984.
86.1316-84 Calibration; frequency and overview. December 10, 1984.
86.1316-90 Calibration; frequency and overview. April 11, 1989.
86.1318-84 Engine dynamometer system calibrations. December 10, 1984.
86.1319-84 CVS calibration. December 10, 1984.
86.1319-90 CVS calibration. April 11, 1989.
86.1320-88 Gas meter or flow instrumentation calibration, particulate measurement. March 15, 1985.
86.1320-90 Gas meter or flow instrumentation calibration; particulate, methanol, and formaldehyde measurement. April 11, 1989.
86.1321-84 Hydrocarbon analyzer calibration. December 10, 1984.
86.1321-90 Hydrocarbon analyzer calibration. April 11, 1989.
86.1322-84 Carbon monoxide analyzer calibration. November 16, 1983.
86.1323-84 Oxides of nitrogen analyzer calibration. December 10, 1984.
86.1324-84 Carbon dioxide analyzer calibration. November 16, 1983.
86.1326-84 Calibration of other equipment. November 16, 1983.
86.1326-90 Calibration of other equipment. April 11, 1989.
86.1327-84 Engine dynamometer test procedures; overview. December 10, 1984.
86.1327-88 Engine dynamometer test procedures; overview. March 15, 1985.
86.1327-90 Engine dynamometer test procedures; overview. April 11, 1989.

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(a) ...sample collection impingers (or capsules) for formaldehyde (HCHO). A bag or continuous sample of the dilution air...

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86.1330-84 Test sequence, general requirements. November 16, 1983.
86.1330-90 Test sequence, general requirements. April 11, 1989.

86.1332-84 Engine mapping procedures. December 10, 1984.
86.1332-90 Engine mapping procedures. April 11, 1989.
86.1333-84 Transient test cycle generation. November 16, 1983.
86.1333-90 Transient test cycle generation. April 11, 1989.
86.1334-84 Pre-test engine and dynamometer preparation. December 10, 1984.
86.1335-84 Optional forced cool-down procedure. December 10, 1984.
86.1335-90 Optional forced cool-down procedure. April 11, 1989.
86.1336-84 Engine starting and restarting. March 15, 1985.
86.1337-84 Engine dynamometer test run. November 16, 1983.
86.1337-88 Engine dynamometer test run. March 15, 1985.
86.1337-90 Engine dynamometer test run. April 11, 1989.
86.1338-84 Emission measurement accuracy. November 16, 1983.
86.1339-88 Diesel particulate filter handling and weighing. March 15, 1985.
86.1339-90 Particulate filter handling and weighing. April 11, 1989.
86.1340-84 Exhaust sample analysis. December 10, 1984.
86.1340-90 Exhaust sample analysis. April 11, 1989.
86.1341-84 Test cycle validation criteria. March 15, 1985.
86.1341-90 Test cycle validating criteria. April 11, 1989.
86.1342-84 Calculations; exhaust emissions. March 15, 1985.
86.1342-90 Calculations; exhaust emissions. April 11, 1989.

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(d) Meaning of symbols:

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(1)(ii) . . . (101.3 kPa) pressure; or, if gaseous fuels are being used, 18.64 g/ft ^{3} for natural gas and 17.28 g/ft ^{3} for liquefied petroleum gas, assuming an average carbon to hydrogen ratio of 1:3.803 for natural gas and 1:2.656 for liquefied petroleum gas, at 68^{o}F and 760 mm Hg pressure. The Executive Officer may approve other density values deemed appropriate by a manufacturer when gaseous fuels are being used.

* * * * *

(3)(v)(A) $CO_e = (1-0.01925CO_{2e} - 0.000323R)CO_{em}$ for gasoline and petroleum diesel fuel, with hydrogen to carbon ratio of 1.85:1.

(3)(v)(B) $CO_e = [1-(0.01 + 0.005HCR)CO_{2e} - 0.00323R]CO_{em}$ for methanol fuel, where HCR is hydrogen to carbon ratio as measured for the fuel used. For natural gas and liquefied petroleum gas, HCR is assumed to be 2.656 and 3.802, respectively.

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(8)(i) K_H = Humidity correction factor.

* * * * *

(iii) For petroleum-fueled, gaseous-fuel, and methanol-fueled diesel engines: K_H = 1/[1-0.0026(H-75)] (or for SI units, ...

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86.1343-88 Calculations; particulate exhaust emissions (including diesel gaseous-fuel, dual-fuel and multi-fuel engines). April 11, 1989.
86.1344-84 Required information. November 16, 1983.
86.1344-88 Required information. March 15, 1985.
86.1344-90 Required information. April 11, 1989.

Appendix I - Urban Dynamometer Schedules.

(f)(2) EPA Engine Dynamometer Schedule for Heavy-Duty Diesel Engines. December 10, 1984.

Additional Requirements

1. Any reference to vehicle or engine sales throughout the United States shall mean vehicle or engine sales in California.
2. Regulations concerning EPA hearings, EPA inspections, and specific language on the Certificate of Conformity, shall not be applicable to these procedures.
3. Any reference made to Selective Enforcement Auditing (SEA) shall not be applicable to these procedures.
4. Methanol-fueled engines and vehicles shall comply with the "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Liquefied Petroleum Gas- or Gasoline- or Methanol-Fueled Motor Vehicles," as incorporated in Title 13, California Code of Regulations, Section 1976.
5. In addition to the standards and provisions specified in CFR Section 86.091-11 and 86.094-11 (emission standards for diesel-fuel and diesel methanol heavy-duty engines and vehicles), the following formaldehyde emission levels as measured under transient operating conditions shall not be exceeded for methanol-fueled engines and vehicles:

Model Year	Formaldehyde (g/bhp-hr)
1993-1995	0.10
1996 and Subsequent	0.05

The following formaldehyde emission levels as measured under transient operating conditions shall not be exceeded for 1992 and subsequent low-emission and ultra-low-emission vehicles and engines used in low-emission and ultra-low-emission vehicles operating on any fuel.

Model Year	Formaldehyde (g/bhp-hr)
1992 and Subsequent Low-Emission Vehicles and Engines	0.050
1992 and Subsequent Ultra-Low-Emission Vehicles and Engines	0.025

6. All dedicated gaseous-fuel, dual-fuel, and multi-fuel diesel engines (and vehicles), including those engines derived from existing diesel engines shall

comply with the requirements which are applicable to heavy-duty diesel engines, except where otherwise noted.

7. Non-methane hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures," as last amended July 12, 1991, which is incorporated herein by reference.

8. For dual-fuel or multi-fuel gaseous engines and vehicles, the noted deterioration factors shall be determined separately for operation on each type of fuel or combination of fuels that the engine is designed to use. For certification to be granted, the provisions of 86.091-28(c) must be met separately for emissions using each type and combination of fuels.